Item #11: Boiler

Emission Estimates

Date: 01-Jul-04

(Listed as item #11 on the "Campus Inventory" list).

Location: Turner - Building #64

EMISSIONS	Fuel	Maximum Equipment Capacity	EMISSION ESTIMATES Emission Factors from EPA 42:			following estimates based on Emission Factors	
			Reference Table		calculated	calculated	calculated
	Gas	MMBtu/hr 1.339		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO			EPA 42 Table 1.4-1	84	0.082	1.10 E-01	4.83 E-01
NO_x			EPA 42 Table 1.4-1	100	0.098	1.31 E-01	5.75 E-01
SO_2			EPA 42 Table 1.4-2	0.60	0.00059	7.88 E-04	3.45 E-03
PM10			EPA 42 Table 1.4-2	7.60	0.0075	9.98 E-03	4.37 E-02
PM			EPA 42 Table 1.4-2	7.60	0.0075	9.98 E-03	4.37 E-02
Pb			EPA 42 Table 1.4-2	0.0005	4.90 E-07	6.56 E-07	2.87 E-06
VOC			EPA 42 Table 1.4-2	5.50	0.005	7.22 E-03	3.16 E-02
TOC			EPA 42 Table 1.4-2	11.00	0.011	1.44 E-02	6.32 E-02
2-Methylnaphthalene			EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	3.15 E-08	1.38 E-07
3-Methylchloranthrene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
7,12-Dimethylbenz(a)anthracite			EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	2.10 E-08	9.20 E-08
Acenaphthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
Acenaphthylene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
Anthracene			EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	3.15 E-09	1.38 E-08
Arsenic			EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	2.63 E-07	1.15 E-06
Barium			EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	5.78 E-06	2.53 E-05
Benzo(a)anthracene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
Benzene			EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	2.76 E-06	1.21 E-05
Benzo(a)pyrene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.58 E-09	6.90 E-09
Benzo(b)fluoranthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
Benzo(g,h,i)perylene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.58 E-09	6.90 E-09
Benzo(k)fluoranthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
Beryllium			EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	1.58 E-08	6.90 E-08
Butane			EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	2.76 E-03	1.21 E-02
Cadmium			EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.44 E-06	6.32 E-06
Chromium			EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	1.84 E-06	8.05 E-06
Chrysene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
Cobalt			EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	1.10 E-07	4.83 E-07
Copper			EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	1.12 E-06	4.89 E-06
Dibenzo(a,h)anthracene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.58 E-09	6.90 E-09
Dichlorobenzene			EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	1.58 E-06	6.90 E-06
Ethane			EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	4.07 E-03	1.78 E-02
Fluoranthene			EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	3.94 E-09	1.72 E-08
Fluorene			EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	3.68 E-09	1.61 E-08
Formaldehyde			EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	9.85 E-05	4.31 E-04
Hexane			EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	2.36 E-03	1.03 E-02
Indeno(1,2,3-cd)pyrene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.36 E-09	1.03 E-08
Manganese			EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	4.99 E-07	2.18 E-06
Mercury			EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	3.41 E-07	1.49 E-06
Methane			EPA 42 Table 1.4-2	2.30	0.00225	3.02 E-03	1.32 E-02
Molybdenum			EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.44 E-06	6.32 E-06
Naphthalene			EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	8.01 E-07	3.51 E-06
Nickel			EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	2.76 E-06	1.21 E-05
Pentane			EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	3.41 E-03	1.49 E-02
Phenanathrene			EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	2.23 E-08	9.77 E-08
Propane			EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	2.10 E-03	9.20 E-03
Pyrene			EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	6.56 E-09	2.87 E-08
Selenium			EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	3.15 E-08	1.38 E-07
Toluene			EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	4.46 E-06	1.95 E-05
Vanadium			EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	3.02 E-06	1.32 E-05
Zinc			EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	3.81 E-05	1.67 E-04

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled".
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (summer: June 1 to August 31) = 92 days/yr x 12 hr/day = 1,104 hours/year
4. Boiler used during summer for hot water.
5. Identifier #B11.

Abbreviations used::

- MMBtu Million Btu
- hr Hours
- yr Years
- lb_E Pounds of emissions
- ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B11 1 of 1 @2:57PM
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Item #12: Boiler

Emission Estimates

Date: 01-Jul-04

(Listed as item #12 on the "Campus Inventory" list).

Location: Gale Life Science (Biology) - Building #65

EMISSIONS	Fuel	Maximum Equipment Capacity	EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table			following estimates based on Emission Factors: calculated	calculated
	Gas	MMBtu/hr 2.676		$lb_s/10^6$ scf	lb_s/MMBtu	lb_s/hr	ton_s/yr
CO			EPA 42 Table 1.4-1	84	0.082	2.21 E-01	9.66 E-01
NO_x			EPA 42 Table 1.4-1	100	0.098	2.63 E-01	1.15 E+00
SO_2			EPA 42 Table 1.4-2	0.60	0.00059	1.58 E-03	6.90 E-03
PM10			EPA 42 Table 1.4-2	7.60	0.0075	2.00 E-02	8.74 E-02
PM			EPA 42 Table 1.4-2	7.60	0.0075	2.00 E-02	8.74 E-02
Pb			EPA 42 Table 1.4-2	0.0005	4.90 E-07	1.31 E-06	5.75 E-06
VOC			EPA 42 Table 1.4-2	5.50	0.005	1.44 E-02	6.32 E-02
TOC			EPA 42 Table 1.4-2	11.00	0.011	2.89 E-02	1.26 E-01
2-Methylnaphthalene			EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	6.30 E-08	2.76 E-07
3-Methylchloranthrene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
7,12-Dimethylbenz(a)anthracite			EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	4.20 E-08	1.84 E-07
Acenaphthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
Acenaphthylene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
Anthracene			EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	6.30 E-09	2.76 E-08
Arsenic			EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	5.25 E-07	2.30 E-06
Barium			EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	1.16 E-05	5.06 E-05
Benzo(a)anthracene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
Benzene			EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	5.51 E-06	2.41 E-05
Benzo(a)pyrene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	3.15 E-09	1.38 E-08
Benzo(b)fluoranthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
Benzo(g,h,i)perylene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	3.15 E-09	1.38 E-08
Benzo(k)fluoranthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
Beryllium			EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	3.15 E-08	1.38 E-07
Butane			EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	5.51 E-03	2.41 E-02
Cadmium			EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	2.89 E-06	1.26 E-05
Chromium			EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	3.68 E-06	1.61 E-05
Chrysene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
Cobalt			EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	2.21 E-07	9.66 E-07
Copper			EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	2.23 E-06	9.77 E-06
Dibenzo(a,h)anthracene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	3.15 E-09	1.38 E-08
Dichlorobenzene			EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	3.15 E-06	1.38 E-05
Ethane			EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	8.14 E-03	3.56 E-02
Fluoranthene			EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	7.88 E-09	3.45 E-08
Fluorene			EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	7.35 E-09	3.22 E-08
Formaldehyde			EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	1.97 E-04	8.62 E-04
Hexane			EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	4.73 E-03	2.07 E-02
Indeno(1,2,3-cd)pyrene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	4.73 E-09	2.07 E-08
Manganese			EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	9.98 E-07	4.37 E-06
Mercury			EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	6.83 E-07	2.99 E-06
Methane			EPA 42 Table 1.4-2	2.30	0.00225	6.04 E-03	2.64 E-02
Molybdenum			EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	2.89 E-06	1.26 E-05
Naphthalene			EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	1.60 E-06	7.01 E-06
Nickel			EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	5.51 E-06	2.41 E-05
Pentane			EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	6.83 E-03	2.99 E-02
Phenanthrene			EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	4.46 E-08	1.95 E-07
Propane			EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	4.20 E-03	1.84 E-02
Pyrene			EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	1.31 E-08	5.75 E-08
Selenium			EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	6.30 E-08	2.76 E-07
Toluene			EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	8.93 E-06	3.91 E-05
Vanadium			EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	6.04 E-06	2.64 E-05
Zinc			EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	7.61 E-05	3.33 E-04

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled".
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (summer:June 1 to August 31) =92 days/yearx24 hours/da) 2,208 hours/year
4. Boiler used during summer for hot water stil and steam.
5. Identifier #B12.

Abbreviations used::

- MMBtu Million Btu
- hr Hours
- yr Years
- lb_s Pounds of emissions
- ton_s Tons of emissions

Emissions ISU Small Equip 6/24/2003
B12 1 of 1 @2:57PM
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Item #13: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as item #13 on the "Campus Inventory" list).

Location: Holt Arena Building #60

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table		calculated	following estimates based on Emission Factors: calculated	calculated
	Gas	Total of 4 boilers;	MMBtu/hr 5.040		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO		each boiler with		EPA 42 Table 1.4-1	84	0.082	4.15 E-01	1.82 E+00
NO_x		an output of		EPA 42 Table 1.4-1	100	0.098	4.94 E-01	2.16 E+00
SO_2		2.10 MMBtu/hr;		EPA 42 Table 1.4-2	0.60	0.00059	2.96 E-03	1.30 E-02
PM10		Firing rate = 60%		EPA 42 Table 1.4-2	7.60	0.0075	3.76 E-02	1.64 E-01
PM		=60%x2.10=1.26		EPA 42 Table 1.4-2	7.60	0.0075	3.76 E-02	1.64 E-01
Pb		For 4 boilers:		EPA 42 Table 1.4-2	0.0005	4.90 E-07	2.47 E-06	1.08 E-05
VOC		=4x1.26 MMBtu/hr		EPA 42 Table 1.4-2	5.50	0.005	2.72 E-02	1.19 E-01
TOC		=5.04 MMBtu/hr		EPA 42 Table 1.4-2	11.00	0.011	5.44 E-02	2.38 E-01
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	1.19 E-07	5.19 E-07
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	7.91 E-08	3.46 E-07
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	1.19 E-08	5.19 E-08
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	9.88 E-07	4.33 E-06
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	2.17 E-05	9.52 E-05
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	1.04 E-05	4.54 E-05
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	5.93 E-09	2.60 E-08
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	5.93 E-09	2.60 E-08
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	5.93 E-08	2.60 E-07
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	1.04 E-02	4.54 E-02
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	5.44 E-06	2.38 E-05
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	6.92 E-06	3.03 E-05
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	4.15 E-07	1.82 E-06
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	4.20 E-06	1.84 E-05
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	5.93 E-09	2.60 E-08
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	5.93 E-06	2.60 E-05
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	1.53 E-02	6.71 E-02
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	1.48 E-08	6.49 E-08
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	1.38 E-08	6.06 E-08
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	3.71 E-04	1.62 E-03
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	8.89 E-03	3.90 E-02
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.89 E-09	3.90 E-08
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	1.88 E-06	8.22 E-06
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	1.28 E-06	5.63 E-06
Methane				EPA 42 Table 1.4-2	2.30	0.00225	1.14 E-02	4.98 E-02
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	5.44 E-06	2.38 E-05
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	3.01 E-06	1.32 E-05
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	1.04 E-05	4.54 E-05
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	1.28 E-02	5.63 E-02
Phenanthrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	8.40 E-08	3.68 E-07
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	7.91 E-03	3.46 E-02
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	2.47 E-08	1.08 E-07
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	1.19 E-07	5.19 E-07
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	1.68 E-05	7.36 E-05
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	1.14 E-05	4.98 E-05
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	1.43 E-04	6.28 E-04

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled".
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4. Boilers used during winter for heating.
5. Identifier #B13.

Abbreviations used;:

- MMBtu Million Btu
- hr Hours
- yr Years
- lb_E Pounds of emissions
- ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B13 1 of 1 @2:57PM
Syed

Item #14: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as item #14 on the "Campus Inventory" list).

Location: Holt Arena Building #60

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table		calculated	following estimates based on Emission Factors: calculated	calculated
	Gas	Total of 2 boilers;	MMBtu/hr 2.870					
CO		each boiler with		EPA 42 Table 1.4-1	84	0.082	2.36 E-01	1.04 E+00
NO_x		an output of		EPA 42 Table 1.4-1	100	0.098	2.81 E-01	1.23 E+00
SO_2		2.870 MMBtu/hr;		EPA 42 Table 1.4-2	0.60	0.00059	1.69 E-03	7.39 E-03
PM10		and at a		EPA 42 Table 1.4-2	7.60	0.0075	2.14 E-02	9.37 E-02
PM		Firing rate of 50%		EPA 42 Table 1.4-2	7.60	0.0075	2.14 E-02	9.37 E-02
Pb		=50%x2.87=1.435		EPA 42 Table 1.4-2	0.0005	4.90 E-07	1.41 E-06	6.16 E-06
VOC		For 2 boilers:		EPA 42 Table 1.4-2	5.50	0.005	1.55 E-02	6.78 E-02
TOC		=2x1.435 MMBtu/hr		EPA 42 Table 1.4-2	11.00	0.011	3.10 E-02	1.36 E-01
2-Methylnaphthalene		=2.870 MMBtu/hr		EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	6.75 E-08	2.96 E-07
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	4.50 E-08	1.97 E-07
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	6.75 E-09	2.96 E-08
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	5.63 E-07	2.46 E-06
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	1.24 E-05	5.42 E-05
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	5.91 E-06	2.59 E-05
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	3.38 E-09	1.48 E-08
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	3.38 E-09	1.48 E-08
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	3.38 E-08	1.48 E-07
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	5.91 E-03	2.59 E-02
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	3.10 E-06	1.36 E-05
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	3.94 E-06	1.73 E-05
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	2.36 E-07	1.04 E-06
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	2.39 E-06	1.05 E-05
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	3.38 E-09	1.48 E-08
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	3.38 E-06	1.48 E-05
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	8.72 E-03	3.82 E-02
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	8.44 E-09	3.70 E-08
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	7.88 E-09	3.45 E-08
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	2.11 E-04	9.24 E-04
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	5.06 E-03	2.22 E-02
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	5.06 E-09	2.22 E-08
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	1.07 E-06	4.68 E-06
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	7.32 E-07	3.20 E-06
Methane				EPA 42 Table 1.4-2	2.30	0.00225	6.47 E-03	2.83 E-02
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	3.10 E-06	1.36 E-05
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	1.72 E-06	7.52 E-06
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	5.91 E-06	2.59 E-05
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	7.32 E-03	3.20 E-02
Phenanathrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	4.78 E-08	2.10 E-07
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	4.50 E-03	1.97 E-02
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	1.41 E-08	6.16 E-08
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	6.75 E-08	2.96 E-07
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	9.57 E-06	4.19 E-05
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	6.47 E-06	2.83 E-05
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	8.16 E-05	3.57 E-04

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled".
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boilers (all year) = 365 days/year x 14 hours/day = 5,110 hours/year
4. Boilers used all year for domestic hot water.
5. Identifier #B14.

Abbreviations used::

- MMBtu Million Btu
- hr Hours
- yr Years
- lb_E Pounds of emissions
- ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B14 1 of 1 @2:57PM
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Item #15: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as item #15 on the "Campus Inventory" list).

Location: Red Hill Building #40

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES Emission Factors from EPA 42:			following estimates based on Emission Factors	
				Reference Table		calculated	calculated	calculated
	Gas		MMBtu/hr 1.125		$lb_e/10^6$ scf	lb_e/MMBtu	lb_e/hr	ton_e/yr
CO				EPA 42 Table 1.4-1	84	0.082	9.26 E-02	4.06 E-01
NO_x				EPA 42 Table 1.4-1	100	0.098	1.10 E-01	4.83 E-01
SO_2				EPA 42 Table 1.4-2	0.60	0.00059	6.62 E-04	2.90 E-03
PM10				EPA 42 Table 1.4-2	7.60	0.0075	8.38 E-03	3.67 E-02
PM				EPA 42 Table 1.4-2	7.60	0.0075	8.38 E-03	3.67 E-02
Pb				EPA 42 Table 1.4-2	0.0005	4.90 E-07	5.51 E-07	2.42 E-06
VOC				EPA 42 Table 1.4-2	5.50	0.005	6.07 E-03	2.66 E-02
TOC				EPA 42 Table 1.4-2	11.00	0.011	1.21 E-02	5.31 E-02
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	2.65 E-08	1.16 E-07
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	1.76 E-08	7.73 E-08
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	2.65 E-09	1.16 E-08
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	2.21 E-07	9.66 E-07
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	4.85 E-06	2.13 E-05
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	2.32 E-06	1.01 E-05
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.32 E-09	5.80 E-09
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.32 E-09	5.80 E-09
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	1.32 E-08	5.80 E-08
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	2.32 E-03	1.01 E-02
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.21 E-06	5.31 E-06
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	1.54 E-06	6.76 E-06
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	9.26 E-08	4.06 E-07
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	9.38 E-07	4.11 E-06
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.32 E-09	5.80 E-09
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	1.32 E-06	5.80 E-06
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	3.42 E-03	1.50 E-02
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	3.31 E-09	1.45 E-08
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	3.09 E-09	1.35 E-08
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	8.27 E-05	3.62 E-04
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	1.99 E-03	8.70 E-03
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.99 E-09	8.70 E-09
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	4.19 E-07	1.84 E-06
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	2.87 E-07	1.26 E-06
Methane				EPA 42 Table 1.4-2	2.30	0.00225	2.54 E-03	1.11 E-02
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.21 E-06	5.31 E-06
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	6.73 E-07	2.95 E-06
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	2.32 E-06	1.01 E-05
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	2.87 E-03	1.26 E-02
Phenanathrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	1.88 E-08	8.21 E-08
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	1.76 E-03	7.73 E-03
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	5.51 E-09	2.42 E-08
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	2.65 E-08	1.16 E-07
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	3.75 E-06	1.64 E-05
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	2.54 E-06	1.11 E-05
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	3.20 E-05	1.40 E-04

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled"
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4. Boilers used during winter for steam purposes.
5. Identifier #B15.

Abbreviations used::

- MMBtu Million Btu
- hr Hours
- yr Years
- lb_e Pounds of emissions
- ton_e Tons of emissions

Emissions ISU Small Equip 6/24/2003
B15 1 of 1 @2:57PM
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Item #16: Boiler

Emission Estimates

Date: 01-Jul-04

(Listed as item #16 on the "Campus Inventory" list).

Location: Chemistry - Building #03

EMISSIONS	Fuel	Maximum Equipment Capacity	EMISSION ESTIMATES Emission Factors from EPA 42:			following estimates based on Emission Factors	
			Reference Table		calculated	calculated	calculated
	Gas	MMBtu/hr 1.163		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO			EPA 42 Table 1.4-1	84	0.082	9.50 E-02	4.16 E-01
NO_x			EPA 42 Table 1.4-1	100	0.098	1.13 E-01	4.95 E-01
SO_2			EPA 42 Table 1.4-2	0.60	0.00059	6.78 E-04	2.97 E-03
PM10			EPA 42 Table 1.4-2	7.60	0.0075	8.59 E-03	3.76 E-02
PM			EPA 42 Table 1.4-2	7.60	0.0075	8.59 E-03	3.76 E-02
Pb			EPA 42 Table 1.4-2	0.0005	4.90 E-07	5.65 E-07	2.48 E-06
VOC			EPA 42 Table 1.4-2	5.50	0.005	6.22 E-03	2.72 E-02
TOC			EPA 42 Table 1.4-2	11.00	0.011	1.24 E-02	5.45 E-02
2-Methylnaphthalene			EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	2.71 E-08	1.19 E-07
3-Methylchloranthrene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
7,12-Dimethylbenz(a)anthracite			EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	1.81 E-08	7.92 E-08
Acenaphthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
Acenaphthylene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
Anthracene			EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	2.71 E-09	1.19 E-08
Arsenic			EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	2.26 E-07	9.90 E-07
Barium			EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	4.97 E-06	2.18 E-05
Benzo(a)anthracene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
Benzene			EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	2.37 E-06	1.04 E-05
Benzo(a)pyrene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.36 E-09	5.94 E-09
Benzo(b)fluoranthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
Benzo(g,h,i)perylene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.36 E-09	5.94 E-09
Benzo(k)fluoranthene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
Beryllium			EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	1.36 E-08	5.94 E-08
Butane			EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	2.37 E-03	1.04 E-02
Cadmium			EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.24 E-06	5.45 E-06
Chromium			EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	1.58 E-06	6.93 E-06
Chrysene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
Cobalt			EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	9.50 E-08	4.16 E-07
Copper			EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	9.61 E-07	4.21 E-06
Dibenzo(a,h)anthracene			EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.36 E-09	5.94 E-09
Dichlorobenzene			EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	1.36 E-06	5.94 E-06
Ethane			EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	3.50 E-03	1.53 E-02
Fluoranthene			EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	3.39 E-09	1.49 E-08
Fluorene			EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	3.17 E-09	1.39 E-08
Formaldehyde			EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	8.48 E-05	3.71 E-04
Hexane			EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	2.03 E-03	8.91 E-03
Indeno(1,2,3-cd)pyrene			EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.03 E-09	8.91 E-09
Manganese			EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	4.30 E-07	1.88 E-06
Mercury			EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	2.94 E-07	1.29 E-06
Methane			EPA 42 Table 1.4-2	2.30	0.00225	2.60 E-03	1.14 E-02
Molybdenum			EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.24 E-06	5.45 E-06
Naphthalene			EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	6.90 E-07	3.02 E-06
Nickel			EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	2.37 E-06	1.04 E-05
Pentane			EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	2.94 E-03	1.29 E-02
Phenanathrene			EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	1.92 E-08	8.42 E-08
Propane			EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	1.81 E-03	7.92 E-03
Pyrene			EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	5.65 E-09	2.48 E-08
Selenium			EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	2.71 E-08	1.19 E-07
Toluene			EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	3.84 E-06	1.68 E-05
Vanadium			EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	2.60 E-06	1.14 E-05
Zinc			EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	3.28 E-05	1.44 E-04

Notes:

1 Emission factor for "Small Boilers" and "Uncontrolled".
2 Potential hours of operation of boiler (annual) = 8,760 hours/year
3 Actual hours of operation of boiler (summer: June 1 to August 31) = 92 days/year x 24 hours/d 2,208 hours/year
4 Boiler used during summer for heating.
5 Identifier #B16.

Abbreviations used::

MMBtu Million Btu
hr Hours
yr Years
lb_E Pounds of emissions
ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B16 1 of 1 @2:57PM
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Item #17: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as Item #17 on the "Campus Inventory" list).

Location: Armory Building #73

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES Emission Factors from EPA 42:			following estimates based on Emission Factors	
				Reference Table		calculated	calculated	calculated
	Gas		MMBtu/hr 0.650		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO				EPA 42 Table 1.4-1	84	0.082	5.35 E-02	2.34 E-01
NO_x				EPA 42 Table 1.4-1	100	0.098	6.37 E-02	2.79 E-01
SO_2				EPA 42 Table 1.4-2	0.60	0.00059	3.82 E-04	1.67 E-03
PM10				EPA 42 Table 1.4-2	7.60	0.0075	4.84 E-03	2.12 E-02
PM				EPA 42 Table 1.4-2	7.60	0.0075	4.84 E-03	2.12 E-02
Pb				EPA 42 Table 1.4-2	0.0005	4.90 E-07	3.19 E-07	1.40 E-06
VOC				EPA 42 Table 1.4-2	5.50	0.005	3.50 E-03	1.54 E-02
TOC				EPA 42 Table 1.4-2	11.00	0.011	7.01 E-03	3.07 E-02
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	1.53 E-08	6.70 E-08
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	1.02 E-08	4.47 E-08
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	1.53 E-09	6.70 E-09
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	1.27 E-07	5.58 E-07
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	2.80 E-06	1.23 E-05
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	1.34 E-06	5.86 E-06
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	7.65 E-10	3.35 E-09
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	7.65 E-10	3.35 E-09
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	7.65 E-09	3.35 E-08
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	1.34 E-03	5.86 E-03
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	7.01 E-07	3.07 E-06
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	8.92 E-07	3.91 E-06
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	5.35 E-08	2.34 E-07
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	5.42 E-07	2.37 E-06
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	7.65 E-10	3.35 E-09
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	7.65 E-07	3.35 E-06
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	1.98 E-03	8.65 E-03
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	1.91 E-09	8.37 E-09
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	1.78 E-09	7.82 E-09
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	4.78 E-05	2.09 E-04
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	1.15 E-03	5.02 E-03
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.15 E-09	5.02 E-09
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	2.42 E-07	1.06 E-06
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	1.66 E-07	7.26 E-07
Methane				EPA 42 Table 1.4-2	2.30	0.00225	1.47 E-03	6.42 E-03
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	7.01 E-07	3.07 E-06
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	3.89 E-07	1.70 E-06
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	1.34 E-06	5.86 E-06
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	1.66 E-03	7.26 E-03
Phenanathrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	1.08 E-08	4.75 E-08
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	1.02 E-03	4.47 E-03
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	3.19 E-09	1.40 E-08
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	1.53 E-08	6.70 E-08
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	2.17 E-06	9.49 E-06
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	1.47 E-06	6.42 E-06
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	1.85 E-05	8.09 E-05

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled".
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4. Boilers used during winter for heating.
5. Identifier #B17.

Abbreviations used::

- **MMBtu** Million Btu
- **hr** Hours
- **yr** Years
- **lb_E** Pounds of emissions
- **ton_E** Tons of emissions

Emissions ISU Small Equip 8/24/2003
B17 1 of 1 @2:57PM
Syed

Item #18: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as Item #18 on the "Campus Inventory" list).

Location: Dowling Building #71

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table		calculated	following estimates based on Emission Factors: calculated	calculated
	Gas		MMBtu/hr 0.696		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO				EPA 42 Table 1.4-1	84	0.082	4.90 E-02	2.15 E-01
NO_x				EPA 42 Table 1.4-1	100	0.098	5.83 E-02	2.56 E-01
SO_2				EPA 42 Table 1.4-2	0.60	0.00059	3.50 E-04	1.53 E-03
PM10				EPA 42 Table 1.4-2	7.60	0.0075	4.43 E-03	1.94 E-02
PM				EPA 42 Table 1.4-2	7.60	0.0075	4.43 E-03	1.94 E-02
Pb				EPA 42 Table 1.4-2	0.0005	4.90 E-07	2.92 E-07	1.28 E-06
VOC				EPA 42 Table 1.4-2	5.50	0.005	3.21 E-03	1.41 E-02
TOC				EPA 42 Table 1.4-2	11.00	0.011	6.42 E-03	2.81 E-02
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	1.40 E-08	6.13 E-08
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	9.33 E-09	4.09 E-08
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	1.40 E-09	6.13 E-09
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	1.17 E-07	5.11 E-07
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	2.57 E-06	1.12 E-05
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	1.23 E-06	5.37 E-06
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	7.00 E-10	3.07 E-09
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	7.00 E-10	3.07 E-09
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	7.00 E-09	3.07 E-08
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	1.23 E-03	5.37 E-03
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	6.42 E-07	2.81 E-06
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	8.17 E-07	3.58 E-06
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	4.90 E-08	2.15 E-07
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	4.96 E-07	2.17 E-06
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	7.00 E-10	3.07 E-09
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	7.00 E-07	3.07 E-06
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	1.81 E-03	7.92 E-03
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	1.75 E-09	7.67 E-09
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	1.63 E-09	7.15 E-09
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	4.38 E-05	1.92 E-04
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	1.05 E-03	4.60 E-03
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	1.05 E-09	4.60 E-09
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	2.22 E-07	9.71 E-07
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	1.52 E-07	6.64 E-07
Methane				EPA 42 Table 1.4-2	2.30	0.00225	1.34 E-03	5.88 E-03
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	6.42 E-07	2.81 E-06
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	3.56 E-07	1.56 E-06
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	1.23 E-06	5.37 E-06
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	1.52 E-03	6.64 E-03
Phenanthrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	9.92 E-09	4.34 E-08
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	9.33 E-04	4.09 E-03
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	2.92 E-09	1.28 E-08
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	1.40 E-08	6.13 E-08
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	1.98 E-06	8.69 E-06
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	1.34 E-06	5.88 E-06
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	1.69 E-05	7.41 E-05

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled"
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4. Boilers used during winter for heating.
5. Identifier #B18.

Abbreviations used::

- MMBtu Million Btu
- hr Hours
- yr Years
- lb_E Pounds of emissions
- ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B18 1 of 1 @2:57PM
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Item #19: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as item #19 on the "Campus Inventory" list).

Location: Alumni House Building #29

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table			following estimates based on Emission Factors: calculated	calculated
	Gas		MMBtu/hr 0.120		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO				EPA 42 Table 1.4-1	84	0.082	9.88 E-03	4.33 E-02
NO_x				EPA 42 Table 1.4-1	100	0.098	1.18 E-02	5.15 E-02
SO_2				EPA 42 Table 1.4-2	0.60	0.00059	7.06 E-05	3.09 E-04
PM10				EPA 42 Table 1.4-2	7.60	0.0075	8.94 E-04	3.92 E-03
PM				EPA 42 Table 1.4-2	7.60	0.0075	8.94 E-04	3.92 E-03
Pb				EPA 42 Table 1.4-2	0.0005	4.90 E-07	5.88 E-08	2.58 E-07
VOC				EPA 42 Table 1.4-2	5.50	0.005	6.47 E-04	2.83 E-03
TOC				EPA 42 Table 1.4-2	11.00	0.011	1.29 E-03	5.67 E-03
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	2.82 E-09	1.24 E-08
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	1.88 E-09	8.24 E-09
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	2.82 E-10	1.24 E-09
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	2.35 E-08	1.03 E-07
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	5.18 E-07	2.27 E-06
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	2.47 E-07	1.08 E-06
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.41 E-10	6.18 E-10
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.41 E-10	6.18 E-10
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	1.41 E-09	6.18 E-09
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	2.47 E-04	1.08 E-03
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.29 E-07	5.67 E-07
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	1.65 E-07	7.21 E-07
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	9.88 E-09	4.33 E-08
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	1.00 E-07	4.38 E-07
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.41 E-10	6.18 E-10
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	1.41 E-07	6.18 E-07
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	3.65 E-04	1.60 E-03
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	3.53 E-10	1.55 E-09
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	3.29 E-10	1.44 E-09
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	8.82 E-06	3.86 E-05
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	2.12 E-04	9.28 E-04
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.12 E-10	9.28 E-10
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	4.47 E-08	1.96 E-07
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	3.06 E-08	1.34 E-07
Methane				EPA 42 Table 1.4-2	2.30	0.00225	2.71 E-04	1.19 E-03
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.29 E-07	5.67 E-07
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	7.18 E-08	3.14 E-07
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	2.47 E-07	1.08 E-06
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	3.06 E-04	1.34 E-03
Phenanthrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	2.00 E-09	8.76 E-09
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	1.88 E-04	8.24 E-04
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	5.88 E-10	2.58 E-09
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	2.82 E-09	1.24 E-08
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	4.00 E-07	1.75 E-06
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	2.71 E-07	1.19 E-06
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	3.41 E-06	1.49 E-05

Notes:

1 Emission factor for "Small Boilers" and "Uncontrolled".
2 Potential hours of operation of boiler (annual) = 8,760 hours/year
3 Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4 Boilers used during winter for heating.
5 Identifier #B19.

Abbreviations used::

MMBtu Million Btu
hr Hours
yr Years
lb_E Pounds of emissions
ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B19 1 of 1 @2:57PM
Syed

Item #20: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as item #20 on the "Campus Inventory" list).

Location: RFC Building #48

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table		calculated	following estimates based on Emission Factors: calculated	calculated
	Gas		MMBtu/hr 1.500		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO				EPA 42 Table 1.4-1	84	0.082	1.24 E-01	5.41 E-01
NO_x				EPA 42 Table 1.4-1	100	0.098	1.47 E-01	6.44 E-01
SO_3				EPA 42 Table 1.4-2	0.60	0.00059	8.82 E-04	3.86 E-03
PM10				EPA 42 Table 1.4-2	7.60	0.0075	1.12 E-02	4.90 E-02
PM				EPA 42 Table 1.4-2	7.60	0.0075	1.12 E-02	4.90 E-02
Pb				EPA 42 Table 1.4-2	0.0005	4.90 E-07	7.35 E-07	3.22 E-06
VOC				EPA 42 Table 1.4-2	5.50	0.005	8.09 E-03	3.54 E-02
TOC				EPA 42 Table 1.4-2	11.00	0.011	1.62 E-02	7.09 E-02
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	3.53 E-08	1.55 E-07
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	2.35 E-08	1.03 E-07
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	3.53 E-09	1.55 E-08
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	2.94 E-07	1.29 E-06
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	6.47 E-06	2.83 E-05
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	3.09 E-06	1.35 E-05
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.76 E-09	7.73 E-09
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.76 E-09	7.73 E-09
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	1.76 E-08	7.73 E-08
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	3.09 E-03	1.35 E-02
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.62 E-06	7.09 E-06
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	2.06 E-06	9.02 E-06
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	1.24 E-07	5.41 E-07
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	1.25 E-06	5.48 E-06
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.76 E-09	7.73 E-09
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	1.76 E-06	7.73 E-06
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	4.56 E-03	2.00 E-02
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	4.41 E-09	1.93 E-08
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	4.12 E-09	1.80 E-08
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	1.10 E-04	4.83 E-04
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	2.65 E-03	1.16 E-02
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.65 E-09	1.16 E-08
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	5.59 E-07	2.45 E-06
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	3.82 E-07	1.67 E-06
Methane				EPA 42 Table 1.4-2	2.30	0.00225	3.38 E-03	1.48 E-02
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.62 E-06	7.09 E-06
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	8.97 E-07	3.93 E-06
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	3.09 E-06	1.35 E-05
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	3.82 E-03	1.67 E-02
Phenanthrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	2.50 E-08	1.10 E-07
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	2.35 E-03	1.03 E-02
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	7.35 E-09	3.22 E-08
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	3.53 E-08	1.55 E-07
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	5.00 E-06	2.19 E-05
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	3.38 E-06	1.48 E-05
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	4.26 E-05	1.87 E-04

Notes:

1 Emission factor for "Small Boilers" and "Uncontrolled".
2 Potential hours of operation of boiler (annual) = 8,760 hours/year
3 Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4 Boilers used during winter for heating.
5 Identifier #B20.

Abbreviations used::

MMBtu Million Btu
hr Hours
yr Years
lb_E Pounds of emissions
ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B20 1 of 1 @2:57PM
Syed

Item #21: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as item #21 on the "Campus Inventory" list).

Location: President's Home Building #30

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES Emission Factors from EPA 42:		following estimates based on Emission Factors	
				Reference Table	calculated	calculated	calculated
	Gas		MMBtu/hr 0.209		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO				EPA 42 Table 1.4-1	84	0.082	1.72 E-02	7.54 E-02
NO_x				EPA 42 Table 1.4-1	100	0.098	2.05 E-02	8.97 E-02
SO_2				EPA 42 Table 1.4-2	0.60	0.00059	1.23 E-04	5.38 E-04
PM10				EPA 42 Table 1.4-2	7.60	0.0075	1.56 E-03	6.82 E-03
PM				EPA 42 Table 1.4-2	7.60	0.0075	1.56 E-03	6.82 E-03
Pb				EPA 42 Table 1.4-2	0.0005	4.90 E-07	1.02 E-07	4.49 E-07
VOC				EPA 42 Table 1.4-2	5.50	0.005	1.13 E-03	4.94 E-03
TOC				EPA 42 Table 1.4-2	11.00	0.011	2.25 E-03	9.87 E-03
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	4.92 E-09	2.15 E-08
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	3.28 E-09	1.44 E-08
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	4.92 E-10	2.15 E-09
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	4.10 E-08	1.79 E-07
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	9.02 E-07	3.95 E-06
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	4.30 E-07	1.88 E-06
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	2.46 E-10	1.08 E-09
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	2.46 E-10	1.08 E-09
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	2.46 E-09	1.08 E-08
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	4.30 E-04	1.88 E-03
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	2.25 E-07	9.87 E-07
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	2.87 E-07	1.26 E-06
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	1.72 E-08	7.54 E-08
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	1.74 E-07	7.63 E-07
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	2.46 E-10	1.08 E-09
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	2.46 E-07	1.08 E-06
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	6.35 E-04	2.78 E-03
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	6.15 E-10	2.69 E-09
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	5.74 E-10	2.51 E-09
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	1.54 E-05	6.73 E-05
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	3.69 E-04	1.62 E-03
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	3.69 E-10	1.62 E-09
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	7.79 E-08	3.41 E-07
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	5.33 E-08	2.33 E-07
Methane				EPA 42 Table 1.4-2	2.30	0.00225	4.71 E-04	2.06 E-03
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	2.25 E-07	9.87 E-07
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	1.25 E-07	5.47 E-07
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	4.30 E-07	1.88 E-06
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	5.33 E-04	2.33 E-03
Phenanthrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	3.48 E-09	1.53 E-08
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	3.28 E-04	1.44 E-03
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	1.02 E-09	4.49 E-09
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	4.92 E-09	2.15 E-08
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	6.97 E-07	3.05 E-06
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	4.71 E-07	2.06 E-06
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	5.94 E-06	2.60 E-05

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled".
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4. Boilers used during winter for heating.
5. Identifier #B21.

Abbreviations used::

- MMBtu Million Btu
- hr Hours
- yr Years
- lb_E Pounds of emissions
- ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
B21 1 of 1 @2:57PM
Syed

Item #22: Boilers

Emission Estimates

Date: 01-Jul-04

(Listed as item #22 on the "Campus Inventory" list).

Location: President's Home Building #30

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table		calculated	following estimates based on Emission Factors: calculated	calculated
	Gas		MMBtu/hr 0.608		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO				EPA 42 Table 1.4-1	84	0.082	4.18 E-02	1.83 E-01
NO_x				EPA 42 Table 1.4-1	100	0.098	4.98 E-02	2.18 E-01
SO_2				EPA 42 Table 1.4-2	0.60	0.00059	2.99 E-04	1.31 E-03
PM10				EPA 42 Table 1.4-2	7.60	0.0075	3.79 E-03	1.66 E-02
PM				EPA 42 Table 1.4-2	7.60	0.0075	3.79 E-03	1.66 E-02
Pb				EPA 42 Table 1.4-2	0.0005	4.90 E-07	2.49 E-07	1.09 E-06
VOC				EPA 42 Table 1.4-2	5.50	0.005	2.74 E-03	1.20 E-02
TOC				EPA 42 Table 1.4-2	11.00	0.011	5.48 E-03	2.40 E-02
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	1.20 E-08	5.24 E-08
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
7,12-Dimethylbenz(a)anthracene				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	7.97 E-09	3.49 E-08
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	1.20 E-09	5.24 E-09
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	9.96 E-08	4.36 E-07
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	2.19 E-06	9.60 E-06
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	1.05 E-06	4.58 E-06
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	5.98 E-10	2.62 E-09
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	5.98 E-10	2.62 E-09
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	5.98 E-09	2.62 E-08
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	1.05 E-03	4.58 E-03
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	5.48 E-07	2.40 E-06
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	6.97 E-07	3.05 E-06
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	4.18 E-08	1.83 E-07
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	4.23 E-07	1.85 E-06
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	5.98 E-10	2.62 E-09
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	5.98 E-07	2.62 E-06
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	1.54 E-03	6.76 E-03
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	1.49 E-09	6.54 E-09
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	1.39 E-09	6.11 E-09
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	3.74 E-05	1.64 E-04
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	8.96 E-04	3.93 E-03
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	8.96 E-10	3.93 E-09
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	1.89 E-07	8.29 E-07
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	1.29 E-07	5.67 E-07
Methane				EPA 42 Table 1.4-2	2.30	0.00225	1.15 E-03	5.02 E-03
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	5.48 E-07	2.40 E-06
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	3.04 E-07	1.33 E-06
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	1.05 E-06	4.58 E-06
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	1.29 E-03	5.67 E-03
Phenanthrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	8.47 E-09	3.71 E-08
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	7.97 E-04	3.49 E-03
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	2.49 E-09	1.09 E-08
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	1.20 E-08	5.24 E-08
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	1.69 E-06	7.42 E-06
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	1.15 E-06	5.02 E-06
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	1.44 E-05	6.33 E-05

Notes:

1. Emission factor for "Small Boilers" and "Uncontrolled".
2. Potential hours of operation of boiler (annual) = 8,760 hours/year
3. Actual hours of operation of boiler (winter: Sept 1 to May 31) = 273 days/year x 24 hours/day = 6,552 hours/year
4. Boilers used during winter for heating.
5. Identifier #B22.

Abbreviations used::

- **MMBtu** Million Btu
- **hr** Hours
- **yr** Years
- **lb_E** Pounds of emissions
- **ton_E** Tons of emissions

Emissions ISU Small Equip 6/24/2003
B22 1 of 1 @2:57PM
Syed

Item #23: Kiln

Emission Estimates

Date: 01-Jul-04

(Listed as item #23 on the "Campus Inventory" list).

Location: Votech Building #46

EMISSIONS	Fuel	Maximum Equipment Capacity		EMISSION ESTIMATES: Emission Factors from EPA 42: Reference Table		calculated	following estimates based on Emission Factors: calculated	calculated
	Gas	Total of 9 kilns;	MMBtu/hr 0.0143		$lb_E/10^6$ scf	lb_E/MMBtu	lb_E/hr	ton_E/yr
CO		upto 6 kilns used		EPA 42 Table 1.4-1	84	0.082	1.18 E-03	5.16 E-03
NO_X		at a time, and		EPA 42 Table 1.4-1	100	0.098	1.40 E-03	6.14 E-03
SO_2		each kiln with		EPA 42 Table 1.4-2	0.60	0.00059	8.41 E-06	3.68 E-05
PM10		an input of		EPA 42 Table 1.4-2	7.60	0.0075	1.07 E-04	4.67 E-04
PM		0.0028 MMBtu/hr;		EPA 42 Table 1.4-2	7.60	0.0075	1.07 E-04	4.67 E-04
Pb		therefore equal to		EPA 42 Table 1.4-2	0.0005	4.90 E-07	7.01 E-09	3.07 E-08
VOC		=9 x 0.0028 MMBtu/hr		EPA 42 Table 1.4-2	5.50	0.005	7.71 E-05	3.38 E-04
TOC		=0.0143 MMBtu/hr		EPA 42 Table 1.4-2	11.00	0.011	1.54 E-04	6.75 E-04
2-Methylnaphthalene				EPA 42 Table 1.4-3	2.4 E-05	2.35 E-08	3.36 E-10	1.47 E-09
3-Methylchloranthrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
7,12-Dimethylbenz(a)anthracite				EPA 42 Table 1.4-3	1.6 E-05	1.57 E-08	2.24 E-10	9.82 E-10
Acenaphthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
Acenaphthylene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
Anthracene				EPA 42 Table 1.4-3	2.4 E-06	2.35 E-09	3.36 E-11	1.47 E-10
Arsenic				EPA 42 Table 1.4-4	2.0 E-04	1.96 E-07	2.80 E-09	1.23 E-08
Barium				EPA 42 Table 1.4-4	4.4 E-03	4.31 E-06	6.17 E-08	2.70 E-07
Benzo(a)anthracene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
Benzene				EPA 42 Table 1.4-3	2.1 E-03	2.06 E-06	2.94 E-08	1.29 E-07
Benzo(a)pyrene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.68 E-11	7.37 E-11
Benzo(b)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
Benzo(g,h,i)perylene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.68 E-11	7.37 E-11
Benzo(k)fluoranthene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
Beryllium				EPA 42 Table 1.4-4	1.2 E-05	1.18 E-08	1.68 E-10	7.37 E-10
Butane				EPA 42 Table 1.4-3	2.1 E+00	2.06 E-03	2.94 E-05	1.29 E-04
Cadmium				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.54 E-08	6.75 E-08
Chromium				EPA 42 Table 1.4-4	1.4 E-03	1.37 E-06	1.96 E-08	8.59 E-08
Chrysene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
Cobalt				EPA 42 Table 1.4-4	8.4 E-05	8.24 E-08	1.18 E-09	5.16 E-09
Copper				EPA 42 Table 1.4-4	8.5 E-04	8.33 E-07	1.19 E-08	5.22 E-08
Dibenzo(a,h)anthracene				EPA 42 Table 1.4-3	1.2 E-06	1.18 E-09	1.68 E-11	7.37 E-11
Dichlorobenzene				EPA 42 Table 1.4-3	1.2 E-03	1.18 E-06	1.68 E-08	7.37 E-08
Ethane				EPA 42 Table 1.4-3	3.1 E+00	3.04 E-03	4.34 E-05	1.90 E-04
Fluoranthene				EPA 42 Table 1.4-3	3.0 E-06	2.94 E-09	4.20 E-11	1.84 E-10
Fluorene				EPA 42 Table 1.4-3	2.8 E-06	2.75 E-09	3.92 E-11	1.72 E-10
Formaldehyde				EPA 42 Table 1.4-3	7.5 E-02	7.35 E-05	1.05 E-06	4.60 E-06
Hexane				EPA 42 Table 1.4-3	1.8 E+00	1.76 E-03	2.52 E-05	1.10 E-04
Indeno(1,2,3-cd)pyrene				EPA 42 Table 1.4-3	1.8 E-06	1.76 E-09	2.52 E-11	1.10 E-10
Manganese				EPA 42 Table 1.4-4	3.8 E-04	3.73 E-07	5.33 E-09	2.33 E-08
Mercury				EPA 42 Table 1.4-4	2.6 E-04	2.55 E-07	3.64 E-09	1.60 E-08
Methane				EPA 42 Table 1.4-2	2.30	0.00225	3.22 E-05	1.41 E-04
Molybdenum				EPA 42 Table 1.4-4	1.1 E-03	1.08 E-06	1.54 E-08	6.75 E-08
Naphthalene				EPA 42 Table 1.4-3	6.1 E-04	5.98 E-07	8.55 E-09	3.74 E-08
Nickel				EPA 42 Table 1.4-4	2.1 E-03	2.06 E-06	2.94 E-08	1.29 E-07
Pentane				EPA 42 Table 1.4-3	2.6 E+00	2.55 E-03	3.64 E-05	1.60 E-04
Phenanthrene				EPA 42 Table 1.4-3	1.7 E-05	1.67 E-08	2.38 E-10	1.04 E-09
Propane				EPA 42 Table 1.4-3	1.6 E+00	1.57 E-03	2.24 E-05	9.82 E-05
Pyrene				EPA 42 Table 1.4-3	5.0 E-06	4.90 E-09	7.01 E-11	3.07 E-10
Selenium				EPA 42 Table 1.4-4	2.4 E-05	2.35 E-08	3.36 E-10	1.47 E-09
Toluene				EPA 42 Table 1.4-3	3.4 E-03	3.33 E-06	4.77 E-08	2.09 E-07
Vanadium				EPA 42 Table 1.4-4	2.3 E-03	2.25 E-06	3.22 E-08	1.41 E-07
Zinc				EPA 42 Table 1.4-4	2.9 E-02	2.84 E-05	4.06 E-07	1.78 E-06

Notes:

1 Emission factor for "Small Boilers" and "Uncontrolled".

2 Potential hours of operation (annual) = 8,760 hours/year

3 Actual hours of operation = 24 hours/day x 3 days/wk x 2 wk/mon x 9 mon/yr x 5 kilns = 6,480 hours/year

4 Kiln used for pottery and sculpting classes.

5 Identifier #K23.

Abbreviations used::

MMBtu Million Btu

hr Hours

yr Years

lb_E Pounds of emissions

ton_E Tons of emissions

Emissions ISU Small Equip 6/24/2003
K23 1 of 1 @2:57PM
Syed